

CONTEMPORARY PROFILE OF PERCUTANEOUS CORONARY INTERVENTION IN OCTOGENARIANS

PERFIL CONTEMPORÂNEO DA INTERVENÇÃO CORONÁRIA PERCUTÂNEA EM OCTOGENÁRIOS

ABSTRACT

Introduction: With the increase in longevity observed in recent decades, percutaneous coronary interventions (PCI) in octogenarians are increasingly indicated. **Objective:** To outline the clinical, epidemiological and angiographic profile and main details associated with PCI in octogenarian patients. **Methods:** One hundred and fifty octogenarian patients underwent PCI between January 2015 and December 2016 at the Dante Pazzanese Institute of Cardiology, corresponding to 3.7% of the 3987 cases treated and 18% of those aged > 70 years, and included sequentially and prospectively. There were no exclusion criteria. The clinical results were restricted to the hospital phase. **Results:** The majority (63%) were males, with a mean age of 86 ± 3.9 years (maximum 102 years). Of the total patients, 91.3% were hypertensive, 37.4% were diabetic, 17.4% had previously undergone PCI, while 34.1% had previous infarction. The coronary angiography indicated that 70.4% were multiaarterial, of which 4% had unprotected lesions of the trunk of the left coronary artery. The majority (55%) had significant ventricular dysfunction. Pharmacological stents were used in 97.2% of the cases. Angiographic success was achieved in 97.5% and clinical success in 93.2%. Mortality and infarction occurred in less than 4.3% of the cases. **Conclusion:** In this population, it was observed that octogenarian patients constituted a minority of treated elderly; severe multivessel disease was the predominant finding; pharmacological stents were implanted in almost all cases, and angiographic and clinical success rates were high.

Keywords: Percutaneous coronary intervention; Octogenarians; Coronary disease.

RESUMO

Introdução: Com o aumento da longevidade observado nas últimas décadas, as intervenções coronárias percutâneas (ICP) em octogenários são cada vez mais indicadas. **Objetivo:** Traçar o perfil clínico-epidemiológico-angiográfico e os principais detalhes associados à ICP dos pacientes octogenários. **Métodos:** Cento e cinquenta pacientes octogenários foram submetidos à ICP entre janeiro de 2015 a dezembro de 2016, no Instituto Dante Pazzanese de Cardiologia, correspondendo a 3,7% dos 3987 casos tratados e a 18% dos com idade > 70 anos, e incluídos de forma sequencial e prospectiva. Não houve critérios de exclusão. Os resultados clínicos expostos foram restritos à fase hospitalar. **Resultados:** A maioria (63%) era do sexo masculino, com idade média de $86 \pm 3,9$ anos (máximo de 102 anos). Do total de pacientes, 91,3% eram hipertensos, 37,4% diabéticos, a ICP prévia foi realizada em 17,4%, enquanto 34,1% apresentaram infarto prévio. A cinecoronariografia identificou que 70,4% eram multiarteriais, dos quais 4% exibiam lesões não protegidas do tronco da coronária esquerda. A maioria (55%) apresentava disfunção ventricular significativa. Stents farmacológicos (SF) foram utilizados em 97,2% dos casos. O sucesso angiográfico foi obtido em 97,5% e o sucesso clínico em 93,2%. A mortalidade e o infarto ocorreram abaixo de 4,3% dos casos. **Conclusão:** Nessa população, observaram-se que os pacientes octogenários constituíram a minoria dos idosos tratados; a doença multiarterial grave foi o achado predominante; os stents farmacológicos foram implantados quase em todos os casos e os sucessos angiográfico e clínico apresentaram-se elevados.

Descritores: Intervenção coronária percutânea; Octogenários; Doença das coronárias.

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INTRODUCTION

As the proportion of the elderly in the world population has increased, the number of octogenarians undergoing diagnostic catheterization and percutaneous coronary intervention (PCI) has also increased.¹⁻³

In contrast to younger patients, elderly patients undergoing PCI often have diffuse coronary disease, ventricular dysfunction, acute coronary syndromes, and comorbidities such as renal insufficiency, stroke, and peripheral vascular disease, resulting in adverse clinical scenarios.²⁻⁴

Few studies in Brazil have evaluated the clinical and angiographic characteristics of PCI in very elderly patients.

Thus, this study aimed to outline the clinical, epidemiological, and angiographic profiles and other important factors associated with PCI in octogenarian patients in a large-scale tertiary center.

MATERIALS AND METHODS

Patients that underwent PCI between January 2015 and December 2016 were included in the study. They were selected from a database, and their follow-up was performed prospectively. Subsequently, a retrospective analysis was performed (cohort study).

A total of 150 octogenarian patients, corresponding to 3.7% of the 3987 treated cases and 18% of those aged more than 70 years during the period, were treated. There were no exclusion criteria. The clinical results presented are restricted to the hospital phase.

Patients were medicated before therapeutic PCI with aspirin 100 mg along with clopidogrel at a starting dose of 300 mg and a maintenance dose of 75 mg for one year in cases of drug-eluting stent implantation. Patients received heparin at the beginning of the procedure at a dose of 100 IU/kg.

The choice of stent diameter and length were based on quantitative angiography. Stent implantation was conducted at the discretion of the operator and the team of clinical cardiologists.

RESULTS

The clinical and angiographic characteristics of the 150 octogenarian patients that underwent PCI are shown in Table 1.

The coronary angiography (performed in 67% of the cases through the femoral vein) showed that 70.4% had multivessel disease, of which 4% had unprotected lesions of the left coronary trunk. The majority (55%) had significant ventricular dysfunction. Pharmacological stents (PS) were used in 97.2% of the cases. Angiographic success was achieved in 97.5% of the cases, and clinical success was achieved in 93.2% of the cases. Mortality and myocardial infarction occurred in less than 4.3% of the cases. (Table 2)

DISCUSSION

The number of elderly people undergoing PCI is increasing.^{3,5} Historically, this population has a worse prognosis when compared to younger populations.^{5,6} Indeed, the original prescriptions for angioplasty established by Gruntzig⁷ excluded older patients because they were considered to be at greater risk with a lower chance of success.⁸ However, in the decades since its inception, PCI has been proven to be a therapeutic option increasingly used in the elderly.

Table 1. Clinical characteristics of octogenarian patients undergoing percutaneous coronary intervention.

Variables	150 patients
Age (mean)	86 ± 3.9 years
Male	63%
Active smoking	3.3%
Diabetes mellitus	37.4%
Systemic arterial hypertension	91.3%
Hypercholesterolemia	72.2%
Chronic renal insufficiency	79.2%
Peripheral arterial disease	2.1%
Stroke	6.2%
Previous myocardial infarction	34.1%
Previous CABG	2.1%
Previous percutaneous intervention	17.4%
Clinical presentation	
Stable angina	35%
ACS without STE	50%
ACS with STE	15%

CABG = coronary artery bypass graft surgery; ACS = acute coronary syndrome; STE = ST elevation.

Table 2. Clinical results in the hospital phase.

Variables	P (n= 150)
Success of the procedure	97.5%
Major complications	4.8%
- Myocardial infarction	2.1%
- Death	1.5%
- Emergency surgery	1.2%
Renal insufficiency	3.7%

P = patients.

PCI demonstrated effectiveness in controlling symptoms in our series of patients aged more than 80 years, as clinical and angiographic success was achieved in 93% and 97% of the cases, respectively. This result is even more relevant in light of the fact that very elderly patients have several specific factors that aggravate coronary disease as compared to younger patients.

Moreover, elderly patients undergoing percutaneous revascularization procedures are more likely to have diffuse disease, ventricular dysfunction, acute coronary syndromes, and comorbidities such as renal insufficiency, stroke, and chronic obstructive pulmonary disease, leaving them with an unfavorable clinical prognosis.^{2,4,9,10}

Controlled clinical studies generally do not include individuals with the most severe clinical characteristics (extreme age and comorbidities), which renders the guidelines inapplicable in clinical practice, where treatment individualization is critical.

The *Trial of Invasive Versus Medical Therapy in Elderly Patients* (TIME) was the first prospective and controlled clinical study comparing invasive strategies (PCI or CABG) with optimized drug therapy in patients aged 75 years or older. The authors concluded that the symptoms, quality of life, mortality, and incidence of myocardial infarction were similar in the first year.¹⁰

Regarding the baseline clinical characteristics, a higher prevalence of chronic renal dysfunction was observed in octogenarians, supporting the findings of earlier studies.^{3,11,12} The prevalence of important comorbidities such as hypertension, diabetes, and previous coronary disease was similar to that in cohorts of the general population.

In terms of the clinical presentation of coronary artery disease, a higher incidence of cases was observed in the presence of acute coronary syndrome, which was also reported in other studies.² In clinical practice, many cardiologists still opt for conservative strategies for older patients, except in cases of limiting angina or acute coronary syndrome.^{10,11,13,14}

Our choice of access route was similar to that used in other studies.^{3,15} The preferred access route in the elderly is the femoral vein. Very elderly patients may have complex vascular anatomy with difficult radial access, pronounced tortuosity, vascular calcification, and fine vessels.³

The availability of drug-eluting stents plays a prominent role in this context since they are shown to be associated with lower rates of angiographic and clinical restenosis. A meta-analysis published in 2009 including more than 270,000 patients found that the use of pharmacological stents in the real-world setting resulted in significant reductions in mortality, myocardial infarction, and additional revascularizations in late clinical evolution.¹⁶⁻¹⁸ In our series of patients, only a few

individuals used a conventional stent, owing to the contraindications of prolonged dual antiplatelet therapy.

Finally, complications associated with cardiac catheterization are the main limitations of this technique and may range from mild and transient events to severe events such as myocardial infarction or death. We found that most of the patients did not experience any complications during or immediately after the procedure. The major complications observed are consistent with those described in the literature, considering the age range of this population.¹⁹

Limitations

The following limitations should be emphasized: 1) this study was performed in a single center; 2) the sample number is insufficient to allow external validation; 3) since the Dante Pazzanese Institute of Cardiology is a tertiary hospital, many patients who had acute coronary syndrome were referred from other hospitals in the network and the number of cases might have been overestimated; and 4) late results observed during the clinical evolution were not evaluated in this series.

CONCLUSIONS

Most of the elderly patients treated during the study period were not octogenarians; important comorbidities were common; two-thirds of the octogenarian patients presented with acute coronary syndrome; severe multivessel disease was the predominant finding; pharmacological stents were implanted in almost all cases; and the rates of angiographic and clinical success were high.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest in conducting this study.

AUTHORS' CONTRIBUTIONS: All authors contributed individually and significantly to the development of the manuscript. RAPF, LFLT, NTC, MPC, AJC, ACLSA, ACSS, JRCJ, AGMRS, JEMRS performed the medical care/procedure in the patients at the time of the study, read and approved the manuscript.

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